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Nordic re-parameterisation of the ECOSYS ingestion model

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The NKS-B PardNor activity, which was finalised at the end of 2010, had the objective of generating parametric improvements for the ECOSYS model, which is essentially the ingestion dose model integrated in the two most widely used European decision support systems for accidents at nuclear installations - ARGOS and RODOS. In-line with recommendations from the originators of the ECOSYS model, one of the tasks of the Nordic work group was to customise the model for local use in each of the Nordic countries. This required identification of local parameters such as typical consumption rates of dietary constituents, animal feeding regimes, and seasonal crop development. Also new parameters for modelling of a series of important generic processes were identified, since it was evident that the ECOSYS parameterisation originating from the 1980's did not reflect the best knowledge of today. These processes included deposition to crops, soil and snow, natural weathering of contaminants on crops, leaching, fixation, desorption and resuspension of contaminants in soil, soil-to-plant transfer for different soil types, and transfer to meat and milk of farm animals.

ECOSYS model runs demonstrated that some of the generic parameter improvements actually changed estimates of contamination levels and dose contributions by orders of magnitude. Since the quality of European emergency consequence prognoses could thus be improved considerably, it is the hope of the work group that the parameters be integrated in ARGOS and RODOS to ensure justification and optimisation of intervention in the event of an emergency situation.

The presentation will give examples of ECOSYS parameter revisions and associated changes in consequence estimates.